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Mabon (W^m) Flint (W^m H.)
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Clinical Observations on the
Action of
Sulfonal-Bayer.

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BY

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A series of primary contributions on the use of SULFONAL are contained in our pamphlet entitled "A Digest of the more important publications on Sulfonal-Bayer," issued some months since. That pamphlet is still in print and will be mailed on application.

SULFONAL-BAYER.

GENERAL OBSERVATIONS.

SULFONAL was discovered by Professor Eugen A. Baumann, of Freiburg University, and was first prepared by the Farbenfabriken vorm. Friedr. Bayer & Co., Elberfeld.

SULFONAL (Diethylsulfondimethylmethan) is in the form of colorless prisms, odorless and tasteless, melting at 125.5°C . (258°F .), and has the composition $(\text{C}_2\text{H}_5\text{SO}_2)_2$. It is slightly soluble in cold water, but easily soluble in hot water or alcohol.

One part of Sulfonal is soluble in 550 parts of water, at the ordinary temperature; in 450 parts of water, at blood-heat; in 18 to 20 parts of water, at the boiling-point.

The following conclusions have thus far been formed from the experience derived from the use of Sulfonal.

Sulfonal is a prompt and reliable hypnotic which in proper doses produces quiet, natural sleep, lasting a number of hours.

Sulfonal has no unfavorable effects on the heart and the circulation, nor on the temperature, the pulse, or the respiration.

Sulfonal has no disagreeable secondary symptoms; the patients, with very few exceptions, awake from their sleep feeling strong and greatly refreshed.

Sulfonal does not interfere with the process of digestion.

Sulfonal is a real hypnotic which supports the normal periodical desire for sleep, and produces sleep when wanted.

Sulfonal is a hypnotic, and not a narcotic; it acts by giving rest to the cells of the cerebral cortex thereby causing sleep.

Sulfonal does not create an unconquerable desire for its repeated use; there is no danger of a Sulfonal habit. Neither is it necessary to increase the dose after long-continued use.

Sulfonal has no appreciable effect on either the cutaneous or renal secretions.

Sulfonal is best administered at supper-time, dissolved in hot liquids—*e. g.*, a bowl of soup or broth, a cup of milk, tea, coffee, cocoa, etc.

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The Farbenfabriken vormals Friedr. Bayer & Co. have appointed us sole licensees and sole agents for the United States for Sulfonal-BAYER and we offer it to the medical profession put up in half-ounce and one-ounce vials.

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The tablet form is admirably adapted to the purpose of administering this drug, as when they are placed in the liquids they disintegrate and are thus received into the system.

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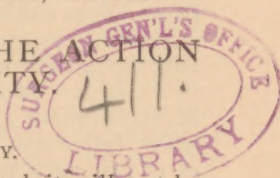
CLINICAL OBSERVATIONS ON THE ACTION OF SULFONAL IN INSANITY.

BY WM. MABON, M.D.,

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As so much has been written of late on sulfonal, it will not be necessary to describe the drug or give its history. In order to test the claims made for this new remedy it was determined to make a series of experiments on cases in this hospital. The observations here recorded were made on patients especially selected, many of whom had resisted the action of other hypnotics.

CASE I.—*Melancholia Agitata*. A. S., woman, aged forty-one. Before and after admission she suffered considerably from loss of sleep, and various hypnotics were administered with but little effect. A combination of chloral and tincture of hyoscyamus gave the most prolonged sleep, but it was restless in character and never continued more than six hours. Sulfonal was administered five times in 15 gr. doses and once in a dose of 30 grs. With the first named quantity sleep resulted in from half an hour to two hours, and continued from five to nine and a half hours. The dose of 30 grs. gave a sleep of nine hours' duration, and was induced in forty-five minutes. With two exceptions, when the sleep was restless and broken, its action was quiet and peaceful. No unpleasant after-effects were produced.



CASE II.—*Chronic Mania*. C. C., female, aged thirty-six. This patient had been unable to sleep more than four hours any night, although she had taken most of the sleep-producing remedies. Both day and night she was noisy and destructive and usually kept other patients awake by her shouting and screaming. Six trials in all were made, in five of which 30 grs. were given and in one 45 grs. With 30 grs. the result was obtained in from three-quarters of an hour to two and one-half hours, and continued from four to nine hours. When the drug gave only four hours' sleep (second trial), its character was restless. The next night, therefore, 45 grs. were given, with which dose, sleep was produced in half an hour, and lasted eight and a half hours. After this half-drachm doses sufficed. No unpleasant after-effects were noted.

CASE III.—*Melancholia*. K. P., woman, aged thirty-six. Complained a good deal of loss of sleep, but generally slept well after taking chloral. As the patient was rapidly forming the chloral habit it was thought well to substitute sulfonal. Fifteen grs. were given twice a night for two nights, when the action proved so slight that the remaining trials were made with 30 gr. doses. With this quantity, which she took four times, sleep resulted each time within an hour and lasted from five to eight hours. In character it was natural and no unpleasant after-effects were observed. After the sixth trial the medicine was discontinued, and from that time she continued to sleep well without any hypnotic until her discharge.

CASE IV.—*Melancholia with Frenzy*. M. A. Q., woman, aged thirty-three. Much disturbed, seldom sleeping more than three hours any night, and occasionally less. The first dose she received was 15 grs., and no effect being apparent in three hours, a second similar dose was given with the effect of producing in one hour a sleep that lasted four and a half hours. The other trials, six in number, were made with 30 gr. doses and gave satisfactory results; sleep commencing in from one to three hours and continuing from six to eight hours. Its character was quite natural, no unpleasant after-effects were observed, and the patient has been less disturbed since taking it.

CASE V.—*Melancholia, with Periods of Great Excitement*. Mrs. E. McM., woman, aged forty. Whenever excited patient is wakeful, noisy, refuses to stay in bed, and is persistently suicidal. Two doses of 15 grs. each were given the first night with negative results. The second trial was made with two doses of 30 grs. After taking the first dose, patient went to sleep in an hour, remained asleep for two hours, and was awake for one hour afterward, when she was given the second dose, which produced in half an hour a sleep that continued for four hours. Five other trials with 30 gr. doses were made and resulted as follows: Sleep commenced once in two hours, once in three hours, once in two and one-half hours, once in half an hour, and once in three-quarters of an hour. It continued once five hours, twice six hours, once eight hours, and once seven hours. In no instance was the sleep fitful in quality, and no unpleasant after-effects were produced.

CASE VI.—*Sub-acute Mania*. E. N., woman, aged thirty. Was quite comfortable until recently, when she began to express delusions and lose sleep. Sulfonal was administered seven times, three times in 15 gr. doses, and the remaining number in doses of 30 grs. With the first named quantity sleep commenced once in three-quarters of an hour, once in an hour and three-quarters, and once in two hours, and continued the first night seven hours, the next seven and three-quarter

hours, and the last five hours. With the 30 gr. doses its effects were in each trial produced within an hour and a half, and continued from seven to nine hours, resembling in character normal sleep. Slight somnolence the next day after taking the first dose of 30 grs. was the only after-effect noted. The patient is now quite comfortable and rests well without any hypnotic—sleeping generally all the night.

CASE VII.—*Periodic Mania*. P. A., woman, aged sixty-two. Recently returned from home (where she had been on parole) in a very disturbed condition. It was impossible for her to obtain sleep lasting more than four or five hours. At times would keep all the other patients in the ward awake with her shouting and pounding on the door. Thirty grs. were given at the first trial, and patient slept seven hours, having gone to sleep three hours after taking it. Five more trials with the same quantity were made with very satisfactory results—*i. e.*, sleep began in from half an hour to three hours, and continued from seven and a half to eight hours. With one exception the rest obtained was quiet and peaceful, and no unpleasant after-effects were produced.

CASE VIII.—*Chronic Mania*. E. N., woman, aged forty-five; violent, homicidal, destructive and noisy; generally sleeps from four to seven hours when taking chloral. Sulfonal was administered in all seven times, in doses of 30 grs., with the following results: Sleep resulted once in two hours, once in an hour and a quarter, twice in half an hour, and three times in an hour. It was natural in character and continued twice eight hours, once eight and one-half hours, once six and one-half hours, and three times nine hours. No after-effects. The sleep produced by chloral in this case was broken in character, and after the effects ceased the patient became noisy. With sulfonal the night that she slept six and one-half hours only, was quiet when awake.

CASE IX.—*Periodic Insanity*. A. H., female, aged thirty-one. During the periods of excitement the patient's rest is much broken. She is then very noisy, up and about her room most of the night, pounding and vociferating, and frequently disturbing the sleep of the others. Thirty grs. were given six times and 45 grs. once. Sleep resulted in each instance within an hour and a half and continued from four to nine hours; once four hours, once seven hours, once six hours, once eight hours, and three times nine hours. The fifth administration produced sleep of a restless character, lasting only four hours. The next night 45 grs. were given, by means of which dose the patient obtained nine hours of nearly natural sleep. The seventh trial was made with a dose of 30 grs., when the effects were apparent in an hour and continued eight hours. No after-effects.

CASE X.—*Chronic Mania*. W. M., woman, aged thirty-one. Unless having had chloral administered, patient is noisy at night. Sulfonal was administered eight times with unsatisfactory results. Three times doses of 30 grs. were given, but the sleep obtained was broken, and in the aggregate did not amount to three hours during any one night. Forty-five grs. were then given for three successive nights, and patient did not get to sleep until three hours had passed. The character of the sleep produced was the same as when she took doses of 30 grs., and its longest duration was only four hours. With 60 gr. doses, which were given twice, the patient went to sleep each time in an hour, and slept soundly four hours. Whenever this patient took chloral in doses of 20 grs. she always obtained from six to eight hours of sound sleep.

CASE XI.—*Acute Mania*. A. D. M., woman, aged forty-one,

Very talkative, incoherent, excitable and noisy. Her nights were sleepless. Six observations were made with doses of 30 grs., and the results obtained were in each instance very gratifying. Sleep was produced as follows: Once in two hours, once in an hour, and four times in half an hour. She slept soundly one night seven and one-half hours, another six hours, another eight hours, and three nights nine hours and a half. No unpleasant after-effects were produced.

CASE XII.—*Melancholia with Frenzy*. H. B., woman, aged sixty-five. By reason of her excitement she was rapidly losing flesh and strength. At times would run up and down the ward wringing her hands and bemoaning her fate, and it was impossible to quiet her. She would also pick her skin, pull out her hair, and tear her clothing. In this case sulfonal was given during the day to test its value as a sedative. Morphia had been given hypodermically with but slight result. January 7th—Was given 15 grs. early in the morning, and after an hour became quiet and remained so for two hours. Again becoming disturbed she was given another dose of the same quantity, and in half an hour she became quiet, and an hour later went to sleep for four hours. January 8th—Was given two more doses of the same amount with similar effect. Both nights the patient slept about six hours, and since that time she has been decidedly more comfortable.

CASE XIII.—*Dementia*. W. J. D., male, aged forty-two. Generally wakeful, and inclined to get out of bed and wander about the ward when not under the influence of hypnotics. Seven trials were made with doses of 30 grs. The first administration induced in half an hour a sleep lasting eight hours. In the remaining six trials sleep resulted in from half an hour to one hour and a half, and continued from six to eight hours. Once it was restless and broken, but in the other trials natural. No unpleasant after-effects were observed. With this patient a combination of chloral and hyoscyamus generally produced continuous sleep for six hours.

CASE XIV.—*Chronic Melancholia*. N. D., male, aged fifty-six. Somewhat irritable, and given to scolding; noisy at night; resists the action of the usual hypnotics, with the exception of chloral, which generally gives from six to eight hours' sound sleep. Three doses of 30 grs. each were given to this patient. The first produced sleep in three-quarters of an hour and continued six and one-half hours; the second trial resulted in the effects being produced in an hour and a quarter and continuing seven hours, but the character of the sleep was restless. Following the third administration the patient went to sleep in an hour, and slept soundly seven hours. No unpleasant after-effects were produced.

CASE XV.—*Melancholia*. G. B., male, aged twenty-seven. Whatever sleep this patient obtained before taking sulfonal was generally broken. Seven trials with doses of 30 grs. were made. In the first, sleep resulted in two hours and continued six hours; in the second, went to sleep in one hour, and slept seven and a half hours; third, effects produced in an hour, and continued seven and one-half hours; fourth, was asleep in an hour and slept five hours, character was broken and restless; fifth, went to sleep in an hour, and slept soundly eight hours; sixth, action began in an hour and the sleep produced continued nine and a half hours; seventh, the effects were observed in half an hour and continued ten hours. With the exception of the fourth trial, the character of the sleep was natural. No unpleasant after-effects were noticed.

CASE XVI.—*Senile Dementia with Depression.* H. W., man, aged seventy-three. Generally noisy at night and not inclined to remain in bed. Doses of 30 and 45 grs. were given. First trial, after taking 30 grs. went to sleep in an hour and slept well for nine hours; was somewhat somnolent the next day. Second, 30 grs., went asleep in an hour and a half, but slept only three hours. Third, 30 grs., result the same as in the second trial. Fourth, 30 grs., slept fitfully during the night about three hours. Fifth, 45 grs., asleep in an hour, and remained asleep for six hours. Sixth, dose 45 grs.; the result of this trial was the same as that in the fifth. Seventh, dose 45 grs.; effects were produced in an hour and continued for seven hours. With the exception of the day following the first administration, no unpleasant after-effects were produced.

CASE XVII.—*Melancholia.* L. D., woman, aged sixty-six. Somewhat hypochondriacal. From the time of admission has complained of not sleeping well. The reports of the night nurses show that she generally obtained sleep of several hours' duration. Nine trials were made with 15 gr. doses, and the sleep that resulted was produced within an hour and a half, and continued from five to seven hours. She complained, however, that she did not get a restful sleep. Four trials of 30 gr. doses were then made, in each of which sleep resulted within an hour and continued nine hours. Said that she rested better than at any time since admission, but thought the medicine produced constipation. This statement, however, is not borne out by the nurse.

CASE XVIII.—*Acute Mania.* F. C., woman, aged thirty-six. Recently admitted. Before coming to the hospital had taken sulfonal with good results. Patient refused to take food and medicine. Said that her dead father appeared to her and told her that she must take neither, but must be cured by faith. Patient was fed by means of stomach-tube, sulfonal being given with the feeding mixture. Four times it was given in doses varying from 15 to 60 grs., but the patient did not obtain more than two hours' sleep at any one time. Before admission she resisted the action of other hypnotics.

REMARKS.—Omitting Case XII., in which it was not used as a hypnotic, sulfonal was administered 119 times on 114 nights, as follows: In 15 gr. doses 26 times, in 30 gr. doses 81 times, in 45 gr. doses 9 times, and 3 times in 60 gr. doses. On 83 nights sleep was produced which continued six hours or more; on 20 nights, from three to six hours, and on 11 nights less than three hours. The sleep produced was natural on 97 nights and restless and broken on 17. In Case X. and Case XVIII. the administration did not give satisfactory results. The time required to produce sleep was on the average one hour and a quarter. The only unpleasant after-effect noted was slight somnolence in two or three instances. With the later administration of the drug in these same cases this symptom was not persistent. In regard to the dosage, the facts brought out by these observations seem to indicate that not much can be expected from 15 gr. doses in the class of cases in which the trials were made. Generally 30 grs. will be found sufficient to bring about a quiet and refreshing sleep. As to the method of administration, in the early trials sulfonal was given suspended in mucilage, but later in hot milk and hot gruel.* The principal advantage of using the latter menstruum was increased

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promptness of action. (In one case there was a difference of an hour between the two methods.) During the period of these experiments comparisons were made with other hypnotics, and the conclusions arrived at were, that in the majority of cases the sleep produced by sulfonal was the most satisfactory; it was calmer, continued longer, and was more refreshing than that produced by any other hypnotic. Among the advantages that sulfonal possesses over other sleep-producing remedies may be mentioned the absence, after its use, of disturbances of digestion, secretion, circulation and respiration; its easiness of administration, its tastelessness, its odorlessness, and, finally, the important fact that the resulting sleep closely approximates in quantity and quality that of nature.

Since the foregoing observations were recorded, the use of sulfonal has been continued by the writer with similarly satisfactory results. —*American Journal of Insanity, April, 1889.*

CLINICAL REPORT ON SULFONAL.

BY WILLIAM H. FLINT, M.D.,

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THE writer's attention having been called to sulfonal by Dr. E. C. Wendt's article in the *Medical Record* of June 2d, 1888, as well as by editorials in the June number of the *Therapeutic Gazette* (page 376) and in the *New York Medical Journal* of July 7th, 1888 (page 9), he placed the drug on trial at the Presbyterian Hospital during his recent summer service in that institution. The observations then begun have been continued during the autumn service of Dr. A. H. Smith, to whose kind courtesy the writer is indebted for the privilege of reporting the more recent cases. The writer is also under many obligations to Dr. D. M. Marvin, house physician at the Presbyterian Hospital, for his efficient services in observing, recording, and tabulating the results attained by the use of the new hypnotic. The clinical features upon which particular stress has been laid in the investigation are: The primary disease of the patient suffering from insomnia; his previous history; the dose of sulfonal administered; the time elapsing after the exhibition of the drug before sleep ensued; the duration of the sleep, its quality, and the after-effects of the remedy. A repetition of these data for each case is rendered unavoidable by the fact that the original tabulated form is not adapted for publication in this journal.

The sulfonal has been administered in powdered form,* inclosed in capsules, and the time selected, unless otherwise stated in the reports of individual cases, has been the usual evening bed-time of the patients. In order to prevent mental impressions, either of a favorable or of an adverse nature, from influencing the results, the patients have not been informed of the nature of the drug or of its expected action.

CASES OF INSOMNIA TREATED WITH SULFONAL.

I. A man, forty years of age, convalescent from an attack of acute articular rheumatism. He stated that persistent insomnia had for

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several years been the bane of his existence. He had often risen from bed and walked the streets at night in the hope of so exhausting himself as to induce sleep. This insomnia was still present.

First Trial.—Dose, 30 grains ; asleep in 45 minutes ; slept 8 hours ; quality of sleep, perfectly natural ; after-effects on pulse, temperature, respiration, cerebrum, and bodily functions, *nil*.

Second Trial.—Dose, 30 grains ; asleep in 30 minutes ; slept 4 hours ; sleep disturbed by return of pain in the rheumatic joints ; after-effect, slight drowsiness during the following forenoon ; subsequently morphine, combined with salicylates, was required on account of articular pain.

2. A man, aged thirty-one, with pulmonary tuberculosis in the cavernous stage, for some time an inmate of the hospital. He had been habitually kept awake by coughing, unless soothed by some anodyne or hypnotic remedy. Generally morphine had been employed.

First Trial.—Dose, 30 grains ; asleep in 25 minutes ; slept 9 hours ; quality of sleep, natural ; after-effect, drowsiness the next morning.

Second Trial.—Dose, 30 grains ; asleep in 30 minutes ; slept 10 hours ; sleep natural and refreshing ; coughing occurred occasionally without awakening the patient ; after-effect, slight drowsiness the next forenoon.

Third Trial.—Identical with the second trial.

Fourth Trial.—Dose, 20 grains ; asleep in 35 minutes ; slept 10 hours ; no drowsiness the next day.

Fifth Trial.—Dose, 20 grains ; asleep in 2 hours ; slept 8 hours. For two hours after the dose was given, pleuritic pains kept the patient awake, but he then slept quietly as in the other trials.

3. A man, forty-two years old. Disease, cancer of the stomach. Was generally very wakeful without hypnotic, even when free from pain. The insomnia is apparently due to the cachexia present.

Dose, 30 grains ; asleep in 50 minutes ; slept $8\frac{1}{2}$ hours ; sleep natural ; no subsequent drowsiness.

4. A man, thirty-eight years of age. Disease, endocarditis and cardiac dilatation due to renal disease. Accustomed for a long time to morphine, and sleepless because of dyspnœa when deprived of it.

Dose, 30 grains ; asleep after suffering from dyspnœa for $3\frac{1}{2}$ hours ; slept restlessly $6\frac{1}{2}$ hours ; no after-effects. Morphine was thereafter preferred because of its tonic action on the heart and its controlling influence on the dyspnœa.

5. A woman, aged thirty-two. Disease, typhoid fever at the beginning of the third week ; pyrexia moderate and easily controlled with acetanilide. The patient is quite wakeful at night, but not delirious.

First Trial.—Dose, 20 grains ; asleep in 35 minutes ; slept 9 hours ; sleep quiet and restful ; after-effect, somnolence the next morning.

Second Trial.—Dose, 20 grains ; asleep in 30 minutes ; slept 7 hours ; sleep natural ; drowsy the following forenoon, but not afternoon.

Third Trial.—Dose, 20 grains ; asleep in 30 minutes ; slept quietly 9 hours ; no drowsiness the next day.

Fourth Trial.—Dose, the same ; asleep in 25 minutes ; slept peacefully 7 hours ; not drowsy.

6. A man, twenty-four years old. Disease, phthisis with cavities ; cough keeps the patient awake. Dose, 30 grains ; asleep in a short time (exact time unknown) ; slept 10 hours ; sleep restless but not broken by cough ; after-effects, none.

7. A woman, aged twenty-one years. Disease, pelvic peritonitis. The patient's pain had almost disappeared, but she was still restless and sleepless. Pain occasionally recurred.

First Trial.—Dose, 20 grains; asleep very soon (exact time not ascertained); slept all night, but in broken snatches on account of recurring pelvic pain.

Second Trial.—Dose, 20 grains; asleep in 30 minutes; slept 9 hours; sleep natural; after-effects, great refreshment and a sense of reinvigoration.

Third Trial.—Dose and results as in the second trial.

Fourth Trial.—Dose, 20 grains; asleep in 4 hours; restless from pelvic pain.

8. A woman, aged twenty-eight years. Disease, malaria. The patient has habitually used opium, and is exceedingly nervous and wakeful without it.

First Trial.—Dose, 20 grains; asleep in 35 minutes; slept 9 hours; sleep quiet; after-effect, drowsiness the following forenoon. The dose was withheld until midnight, and up to that time the patient was quite unable to go to sleep.

Second Trial.—Dose, 20 grains; asleep in 15 minutes; slept 9 hours; sleep perfectly natural and quite profound; after-effect, drowsiness.

Third Trial.—Dose, 20 grains; asleep in 40 minutes; sleep quiet; after-effects, *nil*.

9. A man, twenty-five years of age. Disease, typhoid fever, in the second week of its course. The patient is neurasthenic and is notably restless at night, although his temperature is not high (102° F.).

Dose, 20 grains; asleep in 20 minutes; slept 9 hours; sleep natural; not drowsy. This was repeated several times, with like results.

10. A man, forty years of age. Disease, acute alcoholism with tremor, slight delirium at night, and marked insomnia.

Dose, 20 grains; asleep in 4 hours; sleep broken by noisy delirium. The effect being unsatisfactory, chloral and the bromides were substituted for sulfonal in the further treatment.

11. A woman, aged thirty-six. Disease, hysteria and malarial fever. The patient is exceedingly wakeful and nervous. Her condition sometimes closely resembles *coma vigil*. She says she frequently lies awake all night, and this statement has been verified by actual observation in the hospital.

First Trial.—Dose, 20 grains; asleep in about half an hour; slept 9 hours; sleep quite normal and very refreshing; no after-effects.

Second Trial, made two days later, resulted as the first trial.

Third Trial (made five days after the second).—Dose, 20 grains; asleep in 25 minutes; slept 9½ hours; sleep quiet; after-effects, none. On the nights when the patient did not receive the sulfonal she was as restless and sleepless as usual, and complained bitterly of frontal headache. On the mornings after she had taken the drug the headache was absent in each instance.

12. A man, aged forty-five. Bright's disease, with endocarditis, valvular lesions, and cardiac dilatation. The patient affirms that he "has not had a good night's rest for a month."

Dose, 30 grains; asleep in 40 minutes; slept 9 hours. Patient awakened refreshed, but suffered so much the following day with dyspnoea that morphine was used hypodermically in the subsequent treatment.

13. A woman, aged thirty-two years. Disease, Bright's and endo-

carditis. The patient suffers terribly from dyspnœa, apparently uræmic in nature.

Dose, 20 grains ; sleep entirely prevented by dyspnœa. Experiment not continued.

14. A woman, thirty-eight years of age. Bright's disease. She cannot sleep without a hypnotic, because of severe dyspnœa, often amounting to orthopnœa. She is accustomed to the use of chloral, of the bromides, and of opium in various preparations.

First Trial.—Dose, 20 grains ; asleep in 30 minutes ; slept 9 hours ; sleep natural ; no after-effects.

Second Trial.—Dose, the same ; asleep in 30 minutes ; slept poorly all night.

Third Trial.—Dose, the same ; asleep in 20 minutes ; slept 10 hours ; sleep natural ; no after-effects. A week elapsed between the second and third trials, during which the patient had other hypnotics, chiefly the U. S. solution of morphine, being unable to sleep without some soporific drug.

15. A woman, aged forty-two years. Disease, neuralgia. Patient has habitual insomnia, not always due to pain, but to nervous unrest.

First Trial.—Dose, 20 grains ; asleep in 35 minutes ; slept 6 hours ; sleep quiet and undisturbed ; after-effects, none.

Second Trial (the next night).—Dose, 20 grains ; asleep in 25 minutes ; slept 9 hours ; sleep perfectly tranquil ; no after-effects.

Third Trial (after five nights, during which the patient had no sulfonal, and was perfectly sleepless).—Dose, 20 grains ; asleep in 38 minutes ; slept 9 hours ; sleep excellent and refreshing ; no sequelæ.

16. A woman, aged fifty-five. Disease, splenitis. The patient says she cannot sleep on account of pain in the region of the spleen.

Dose, 20 grains ; asleep in 40 minutes ; slept 9 hours ; sleep natural ; no after-effects.

17. A man, aged twenty-five years. Disease, simple insomnia. After the patient had been wakeful for four hours, the sulfonal was given. Dose, 20 grains ; asleep in 15 minutes ; slept 6 hours ; sleep deep and natural ; no sequelæ.

18. A woman, forty-one years old. Disease, typhoid fever, in the second week, with considerable pyrexia and extensive bronchitis, leading to dyspnœa and some cyanosis. She had been sleepless for the three entire nights preceding the first administration of sulfonal, and had required morphine.

First Trial.—Dose, 20 grains ; asleep in 35 minutes ; slept 9 hours ; sleep perfectly natural ; no after-effects, save improvement in her general condition and lower range of temperature. The patient slept better and longer than when under the influence of the morphine, and subsequently slept for several successive nights without any hypnotic, when the sulfonal was again used with good results.

19. A woman, aged fifty-two. Disease, chronic rheumatism, chiefly in the hip. Has not slept at night for eight days, since the beginning of the last exacerbation of pain.

First Trial.—Dose, 20 grains ; asleep in 20 minutes ; slept 6 hours, but the sleep was restless, unrefreshing and often interrupted by the articular pain.

Second Trial.—Dose, 20 grains ; the result was practically the same, so that the experiment was abandoned.

20. A man, aged forty. Disease, cerebral gumma, with headache and paralysis. The patient has not slept well for two months, usually awakening every hour or two during the night.

First Trial.—Dose, 20 grains ; asleep in an hour ; slept 8 hours ; sleep natural. The patient was somnolent the greater part of the following morning.

Second Trial.—After a week, during which the sleep had been as usual, very restless and frequently broken. Dose, 20 grains ; asleep in 1½ hours ; slept 8 hours ; sleep very tranquil ; no somnolence afterward.

21. A man, aged twenty-one years. Disease, pharyngitis. The patient has not slept well for a week on account of sore throat and cough.

Dose, 20 grains ; asleep in half an hour ; slept 9 hours ; sleep excellent ; no after-effects. On the succeeding nights no hypnotic was needed.

22. A woman, forty-seven years old. Disease, opium-habit of long standing, with obstinate constipation. Large doses of morphine were required to produce sleep at the time when trial was made of sulfonal.

First Trial.—Dose, 20 grains ; did not sleep all night ; complained of the gastric and abdominal pains characteristic of the interrupted opium-habit.

Second Trial.—Dose, 30 grains ; asleep in 35 minutes ; slept quietly 8 hours. No sequelæ.

Third Trial (made after three nights, during which the patient could get but little sleep, morphine being withheld).—Dose, 30 grains ; asleep in 20 minutes ; slept 8½ hours ; sleep natural and without after-effects.

Fourth Trial (after five nights, during which the sleep was better but still very poor).—Dose, 30 grains ; no sleep, because of renewed abdominal pain. U. S. solution of morphine, f ℥ ij, and codeine, gr. j, were required to cause sleep.

Fifth Trial (after three weeks, during which natural sleep had been gradually restored, opium being withheld).—Dose, 30 grains ; asleep in 25 minutes ; slept 10 hours very well, and awoke feeling bright and cheerful.

Sixth Trial (after two days, the patient now having some thoracic and abdominal neuralgia).—Doses, at 8 P.M. 30 grains, and at 9 P.M. 30 grains ; asleep at 10.10 o'clock ; slept 9 hours ; sleep broken occasionally by pain, but for only a few moments ; after-effects *nil*, except a headache, which the patient was suffering from before the sulfonal was given.

23. A man, forty-three years old. Disease, hepatic cirrhosis with ascites, nephritis, and endocarditis. The patient has intense dyspnœa, apparently due to uræmia and to the encroachment of the diaphragm upon the intrathoracic space.

First Trial.—Dose, 20 grains ; asleep not until 4 hours, because of the dyspnœa ; slept 6 hours ; sleep natural, although the exaggerated respiratory movements continued. No drowsiness afterward.

Second Trial (after four nights, during which opium was administered).—Dose, 20 grains ; asleep in an hour ; slept 5 hours ; disturbed by oozing of serum from an abdominal puncture made to remove the ascitic fluid.

Third Trial (after five nights, during which other hypnotics were invariably necessary to produce sleep).—Dose, 30 grains ; asleep in 15 minutes ; slept 7 hours ; sleep more natural than at any time.

24. A man, aged thirty-eight years. Disease, acute rheumatism. The pain is controlled by salicylates, but restlessness and insomnia persist. Dose, 20 grains ; asleep in 30 minutes ; slept 8 hours ; quality of sleep normal ; no after-effects.

25. A woman, twenty-seven years old. Diseases, endometritis and hysterical insomnia. Dose, 20 grains ; asleep in 90 minutes ; slept 7½ hours ; sleep natural ; no drowsiness after awakening. The patient was at first disturbed by noise in the ward. The sleep was devoid of the distressing dreams usually attending it.

26. A woman, twenty-six years of age. Disease, sciatica. The patient never sleeps more than three or four hours consecutively, because of pain.

First Trial.—Dose, 20 grains ; asleep in 60 minutes ; slept 9 hours ; sleep restless and broken by pain.

Second Trial.—Practically the same results, and experiment abandoned.

27. A woman, aged thirty-five years. Diseases, alcoholic gastritis and endometritis. Vomiting and pain prevent sleep.

First Trial.—Dose, 20 grains ; asleep in 70 minutes ; restless sleep all night.

Second Trial (the following night).—Dose, 30 grains ; asleep in 30 minutes ; slept 9 hours ; sleep quiet and natural ; no drowsiness the next day.

28. A man, fifty years old. Disease, dysentery.

First Trial.—Dose, 20 grains ; restless and sleepless all night from tormina and tenesmus.

Second Trial.—Dose, 30 grains ; the same result, so that the experiment was not continued.

29. A man, aged twenty-six years. Disease, acute rheumatism with severe pain, not yet controlled by salicylates. Dose, 30 grains ; asleep in 30 minutes ; slept in a broken and restless manner 7 hours, being awakened, time and again, by pain. Experiment discontinued.

30. A man, thirty-four years of age. Diseases, neurasthenia and exhaustion. The patient has been homeless for two weeks, and has suffered greatly from mental distress and consequent insomnia, never sleeping more than a few hours at a time.

Dose, 30 grains ; asleep in 35 minutes ; slept 10 hours ; sleep natural ; patient much refreshed by sleep.

31. A man, aged forty-six years. Disease, hepatic abscesses following tropical dysentery, spontaneously evacuated through the bronchi and colon. The cough and frequent dejections prevent sleep. Dose, 30 grains, repeated in an hour. Results entirely negative, and experiment abandoned.

32. A man, aged thirty-four. Disease, the opium-habit. After having been broken of the habit for several months, he had a relapse, and, after having injected morphine hypodermically for ten days, himself discontinued the habit a second time, but applied for aid in carrying out his good resolution. For three days and nights he had hardly slept at all, and was much exhausted physically and mentally. On the third day he came under observation, and, having suffered from violent gastric pain and from vomiting, was put upon the milk diet and received 20 grains of sulfonal every two hours for six hours, at the end of which time he fell asleep and slept quietly for seven hours, awaking refreshed and comparatively free from pain. On the following three nights he took two consecutive 20-grain doses of sulfonal, at intervals of two hours, and slept comfortably all night. On the succeeding nights he slept without a hypnotic so long as he remained under observation, which was eight days.

33. A woman, eighteen years old. Diseases, anæmia and hysteria. The patient cannot sleep because of severe dyspnœa, apparently of

purely nervous origin. On one occasion she had orthopnœa for some hours, and f3ij of the U. S. solution of morphine having failed, after two hours, to relieve the dyspnœa, 30 grains of sulfonal were administered. The patient, having kept awake two hours longer, then slept quietly for seven hours in the recumbent position. The next morning she was very drowsy, complaining that she could hardly keep her eyes open. This somnolence passed away during the forenoon.

While the cases reported above are too few to justify any generalizations regarding the exact indications and effects of sulfonal, they yet offer some interesting corroborative evidence regarding its great hypnotic value already established by earlier observations. The general conclusion which may be drawn from these observations is that sulfonal, even in single doses of 20 or 30 grains, is a safe and, in the main, reliable hypnotic, free from unpleasant concomitant effects, and usually from all undesirable sequelæ. The single objectionable after-effect witnessed by the writer has been moderate somnolence on the morning following the administration of the remedy. In none of the cases has there been the slightest derangement of appetite or digestion, nor have the circulation and respiration been appreciably affected at the time of awaking. The cutaneous and renal secretions have neither been increased nor diminished; nausea, vomiting, and constipation have not followed the use of the drug. Several of the cases seem to show that an increase of the original dose is often not required, and that, after a certain time, natural sleep being restored, the sulfonal may be discontinued. This is the only light thrown by the writer's cases upon the important question as to the possibility of engendering a sulfonal habit or of prejudicially affecting the organism by the continued use of sulfonal. The doctrines that sulfonal is of exceptional value in insomnia occasioned by debility, neurasthenia, and mental perturbation, and that it has no appreciable anodyne properties, receive support from the history of several of these cases. Thus, in Case 30, the happiest results followed the use of the drug in a destitute, homeless, neurasthenic, and exhausted patient. The same was true in Cases 11 and 25, of hysteria. In Cases 1, 7, 19, 26, 28, and 29, the pain of acute rheumatism, of pelvic peritonitis, of chronic rheumatism, of sciatica, and of dysentery was not sufficiently controlled by the remedy to permit of quiet sleep. On the other hand, the pain of splenitis (Case 16), of cerebral gumma (Case 20), of pharyngitis (Case 21), and of alcoholic gastritis (Case 27), was not of sufficient violence to prevent the patients from sleeping under the influence of sulfonal. The effect of sulfonal was particularly fortunate in the cases of those patients who had previously been addicted to the use of opium and of other hypnotic drugs or were suffering from insomnia due to the withdrawal of these remedies. These results are illustrated by Cases 4, 22, and 32. In Cases 4, 12, 13, and 14, of insomnia due to the dyspnœa of cardiac and Bright's disease, sulfonal was powerless to produce sleep, and morphine was alone perfectly adequate to meet the indications. In Case 4, of cardiac dyspnœa, the hydrate of amylene proved fairly successful. In Cases 2 and 6 insomnia was occasioned by the harassing cough of pulmonary tuberculosis, but, under the influence of sulfonal, the patients slept better than usual, and although the cough continued during sleep, they were not awakened by it. Sulfonal also rendered excellent services in the insomnia of typhoid fever, as shown by Cases 5, 9, and 18.

The average length of time at which sleep ensued after the administration of the sulfonal was about an hour.

The average duration of sleep was a little over six hours, and success attended the use of the sulfonal in about 82 per cent of all the trials.

The high average of successes, in a series of unselected cases, many of which were plainly unsuitable for experiment with a pure hypnotic, encourages the writer to publish this record in the hope that it may aid in hastening the general introduction of sulfonal.—*New York Medical Journal*, December 15th, 1888.

CLINICAL REPORT ON SULFONAL.

BY ELON N. CARPENTER, M.D.,

Medical Superintendent, Long Island Home, Amityville, L. I.

DURING the month of May, 1888, I was requested to use sulfonal in cases of insomnia accompanying acute and chronic insanity. At that time I had but little knowledge of sulfonal, and was quite reluctant even to give it a trial. Finally, after reading several articles regarding it, I concluded to try it. I did so, beginning in the month of June. In 85 per cent of the cases the result has been very satisfactory. December 15, 1888, my attention was called again to sulfonal by Dr. William H. Flint's article in *The Medical Record* of that date. I decided to make a thorough test of it in cases of insanity and give my personal attention to the same. I selected several of the most violent and destructive patients in the Home, who were in the habit of receiving narcotics or hypnotics each night. The following is the result:

CASE I.—Woman, married, aged thirty-two, chronic mania of three years' standing. Violent. Been receiving medicine at night for past two years. For past month she has been receiving 45 grains of chloral hydrate, 45 minims fluid extract hyoscyamus, which caused her to sleep from 11 P.M. until 5 A.M. Administered 45 grains of sulfonal at 8.10 P.M., patient asleep at 10.45 P.M.; slept soundly until 5.30 A.M.; very quiet during the day. Second trial: Gave 30 grains at 8.30 P.M.; was asleep in 60 minutes; awoke at 5 A.M. Third trial: 8 P.M., 45 grains; asleep at 8.45 P.M.; awoke at 6 A.M. Fourth trial: 8 P.M., 45 grains; asleep in 30 minutes; slept until 7 A.M.

CASE II.—Woman, aged twenty-nine, unmarried. Chronic mania for past 7 years. Destructive. Trial first: 8.10 P.M., 45 grains; went to sleep in two hours; slept well until 5.30 A.M.; quiet during the day; fell asleep at 2.30 P.M.; slept one hour. Second trial: 8.30 P.M., 30 grains; no effect; 2 A.M., gave 45 grains chloral hydrate; she slept until 6 A.M. Third trial: 8 P.M., 45 grains; went to sleep at 1 A.M.; more destructive than usual; awoke, 6.10 A.M. Fourth trial: 8 P.M., 45 grains; 9 P.M., asleep; slept well until 6 A.M.

CASE III.—Woman, unmarried, aged forty-four. Recurrent mania, six years' standing. Very noisy, but not violent or destructive. 8.10 P.M., 45 grains; went to sleep at 10.40 P.M.; slept until 3 A.M.; dose repeated at 3.30 A.M.; went to sleep at once and slept until noon. Second trial: 9 P.M., 30 grains; 9.30 P.M., sleeping; slept until 6 A.M.; awoke, complained of headache and nausea, with some little vomiting; went to sleep at 7.30 A.M.; slept until noon. Third trial: 8 P.M., 30 grains; asleep at 9 P.M.; awoke at 1 A.M.;

asleep at 2.05 A.M. ; awoke at 6.30 A.M. ; very noisy all day. Fourth trial : 8 P.M., 30 grains ; asleep at 8.45 P.M. ; awoke at 7 A.M.

CASE IV.—Woman, unmarried, aged thirty-five, melancholia : 8.10 P.M., 30 grains ; asleep at 10.40 P.M. ; awoke at 5.30 A.M. ; at 8.30 P.M. gave 25 minims of fluid extract of hyoscyamus ; slept from 10 P.M. until 4 A.M. Second trial : 8 P.M., 30 grains ; asleep at 9.18 P.M. ; awoke at 6.08 A.M. Third trial : 8 P.M., 30 grains ; asleep at 8.40 P.M. ; slept until 6.35 A.M.

CASE V.—Woman, married, aged fifty-nine, chronic melancholia with cardiac hypertrophy ; interstitial nephritis, acute : 8.10 P.M., 30 grains ; restless until 2.30 A.M. ; dose repeated ; asleep in 15 minutes. The nurse awoke her at 8 A.M. ; she refused to eat ; immediately went to sleep ; slept until noon ; ate very little during the day. Second trial : 8 P.M., 30 grains ; slept from 9.30 P.M. to 8 A.M. very soundly, when she was awakened ; respiration, 16 ; pulse, 60 ; temperature, 98° F. ; was drowsy all day ; medicine discontinued ; asleep at 10 P.M. ; sleep broken all night ; 8 A.M., respiration, 21 ; pulse, 80 ; temperature normal ; no medicine at night ; 10 P.M., asleep but quite restless ; much demented following day.

CASE VI.—Woman, married, aged sixty-one, hysteria : 8.10 P.M., 20 grains ; slept two hours during the night ; 8 P.M., gave chloral hydrate, 25 grains ; slept from 9.30 P.M. until 6.30 A.M. Second trial : 8 P.M., 30 grains ; asleep at 9.30 P.M. ; awoke, 7.12 A.M. Third trial : 8.30 P.M., 30 grains ; asleep at 12.05 A.M. ; awoke, 4.30 A.M. ; very drowsy and no appetite for breakfast.

CASE VII.—Woman, married, aged twenty-nine, puerperal mania : 8.10 P.M., 30 grains ; asleep at 11 ; awoke at 4 A.M. ; 8 P.M., chloral hydrate, 30 grains ; slept from 9.30 P.M. until 6.30 A.M. Second trial : 8 P.M., 45 grains ; 11 P.M., 30 grains ; asleep, 11.30 ; slept until 7 A.M. Third trial : 8 P.M., 45 grains ; asleep at 10 P.M. ; awoke the following day at 12.10 P.M.

CASE VIII.—Man, single, aged forty-seven, chronic epilepsy of seventeen years' standing, been taking 150 grains chloral hydrate in two doses each night for the past year : 8 P.M., 60 grains ; no sleep ; 11 P.M., 75 grains chloral hydrate and 30 grains sulfonal ; went to sleep at 11.15 P.M. ; slept until 5.30 A.M. ; complained of feeling stupid. Second trial : 8 P.M., 75 grains chloral hydrate and 60 grains sulfonal ; asleep, 8.55 P.M. ; awoke at 6 A.M. ; slept very soundly. Third trial : 8 P.M., 30 grains of sulfonal and 75 grains chloral hydrate ; slept well until 7 A.M. ; very drowsy all day. Fourth trial : 8 P.M., 50 grains chloral hydrate and 30 grains sulfonal ; asleep at 9.15 P.M. ; awoke, 6 A.M. ; complained of being drowsy all the morning.

CASE IX.—Man, married, aged twenty-nine, epilepsy : 8 P.M., 30 grains ; asleep at 11 P.M., until 5 A.M. ; awoke and complained of headache, which lasted three hours. Second trial : 8 P.M., 30 grains ; asleep, 10.30 P.M. ; awoke, 5.30 A.M., with headache and nausea, which lasted until 10 A.M. ; quite stupid ; usually bright ; discontinued medicine ; 10 P.M., asleep ; awoke, 5 A.M., quite refreshed. Third trial : 8 P.M., 30 grains ; asleep at 10 P.M. ; awoke, 6.30 A.M., with headache and nausea ; no appetite during day.

CASE X.—Man, unmarried, aged 35, general paresis, violent : 8 P.M., 45 grains ; asleep at 9 P.M. ; awoke, 5 A.M. Second trial : 8 P.M., 45 grains ; asleep at 9 P.M. ; awoke at 6 A.M. Third trial : 8 P.M., 45 grains ; asleep, 8.45 P.M. ; awoke, 5.30 A.M. Fourth trial : 8 P.M., 45 grains ; asleep at 9 P.M. ; awoke, 6 A.M.

CASE XI.—Man, single, aged twenty, epileptic : 8 P.M., 30 grains ;

asleep at 9 P.M. ; awoke, 5.25 A.M. Second trial : 8 P.M., 30 grains ; asleep at 8.45 P.M. ; awoke, 6 A.M. Third trial : 8 P.M., 30 grains ; asleep at 9.15 P.M. ; awoke at 6.20 A.M. Fourth trial : 8 P.M., 30 grains ; asleep at 9 P.M. ; awoke at 6 A.M.

CASE XII.—Man, married, aged forty, general paresis : 8 P.M., 30 grains ; asleep at 9 P.M. ; awoke at 6 A.M. ; slight headache. Second trial : 8 P.M., 30 grains ; asleep at 9 P.M. ; awoke at 6.10 A.M. with violent headache, and complained of thirst. Third trial : 8 P.M., 25 grains ; asleep at 9 P.M. ; awoke, 5.55 A.M. ; no headache, feeling well. Fourth trial : 8 P.M., 25 grains ; asleep, 8.45 P.M. ; awoke, 6.15 A.M., much refreshed.

CASE XIII.—Man, single, aged twenty-eight, masturbator : 8 P.M., 30 grains ; asleep at 9.10 P.M. ; awoke, 6.05 A.M. Second trial : 8 P.M., 30 grains ; asleep, 9.10 P.M. ; awoke, 6 A.M. ; complained of thirst. Third trial : 8 P.M., 30 grains ; asleep at 8.50 P.M. ; awoke at 6 A.M. ; still complained of thirst. Fourth trial : 8 P.M., 30 grains ; asleep at 9 P.M. ; awoke, 5.30 A.M.

Explanatory reference regarding Cases II., III., IV., VIII., IX., XI., XIII.

CASE II.—One week prior to giving sulfonal, patient was receiving two 45-grain doses of chloral hydrate during the night. I desire to say this patient has been given every narcotic and hypnotic I know of, with but little effect, except chloral hydrate ; she has had no medicine at all for the past week, sleeps well, and is quiet.

CASE III.—Patient has been in an asylum three times in six years. She is now taking 15-grain doses of sulfonal at night, and is more quiet during the day.

CASE IV.—Patient seldom slept over two hours during the night

CASE VIII.—Was admitted to the Home, July, 1888 ; he had been in the habit of taking 150 grains chloral hydrate at night for several months prior to his admission. I ordered him given 75 grains of chloral at 9 P.M., and 75 grains at 11 P.M. He generally went to sleep about 11.30. I made an effort to reduce his chloral, but with poor result, after keeping him on the mixed doses of chloral and sulfonal several days. I ordered the sulfonal discontinued, giving him 75 grains of chloral in two doses at night ; he has been sleeping well for the past ten days and made no complaint.

CASE IX.—Patient has been taking bromide of potassium, 30 grains three times a day ; 20 grains chloral hydrate at bedtime.

CASE XI.—Epilepsy six years ; been taking, for past two months, bromide of potassium, 40 grains three times per day ; 20 grains of chloral at night ; unable to sleep without chloral. Since giving the sulfonal I ordered the chloral discontinued ; he has slept well for the past week.

CASE XIII.—Admitted, January, 1888 ; has had the habit of masturbation for two years ; he is quiet during the day, at night talks incessantly, at times maniacal ; he now sleeps very well on 15 grains sulfonal at night.

These histories, I believe, will show what the virtues of sulfonal are in cases of insomnia accompanying mental diseases. Out of several hundred doses of the drug given, I have detected but very little effect on the cutaneous or renal secretions, no constipation, some nausea and vomiting, but this appeared in cases of epilepsy exclusively.—*The Medical Record*, March 2, 1889.

"ON THE MANNER OF ADMINISTERING AND PRESCRIBING SULFONAL-BAYER."

BY PROFESSOR A. KAST, FREIBURG UNIVERSITY.

(Therapeutische Monatshefte, 1888, Heft 7.)

Various experiments on dogs showed that the best mode of administration of sulfonal is the following :

The crystalline drug should be converted into a fine powder in a mortar, and then either mixed with some solid food—*e.g.*, strewn on a piece of bread and butter, or, better still, dissolved in a plate of soup, a cup of tea, coffee, milk, or broth. This should be taken early in the evening, between 7 and 8 P.M., with the last meal.

When prescribed in this manner, the most favorable conditions for the rapid solution of sulfonal are satisfied, the stomach then containing a considerable amount of liquids with sufficient admixture of muriatic acid, mineral salts, and peptones. This method of administration Kast especially recommends in those cases where prompt and immediate action is desired, or where absorption is to a certain extent interfered with by some concomitant morbid condition.

Professor Kast believes that this furnishes an explanation of the fact that the action of sulfonal is peculiarly unreliable and variable in certain affections of the heart where compensation is but incompletely established—*e.g.*, in certain valvular diseases and in diseases of the heart-muscle in consequence of Arteriosclerosis or Nephritis. In the latter group of cases the rules given by Kast for the administration of sulfonal will be apt to improve its effects and promptness of action, which, he thinks, have heretofore not always been what they should be.

From his observations and experiments, Kast insists it is evident that the mode of action of sulfonal is dependent principally on two points peculiar to this valuable drug. These are :

1. Its solubility in hot liquids, and
2. The power of resistance which its molecule has to chemical decomposition.

The latter Professor Kast has demonstrated by examining the blood of some of his dogs, in whose intestines no traces of sulfonal were to be found. For he could show by various tests that in their blood sulfonal was still present, although it had all disappeared from the digestive tract.

It is this considerable power of resistance to chemical decomposition which, according to Professor Kast, explains its innocuousness, although it may on the other hand be the cause of its long-continued, nay, in some rare cases, even of its delayed action. The latter may be obviated, however, by paying particular attention to its peculiarities in selecting the dose and the dissolving menstruum for each individual case.

In conclusion, Professor Kast expressly remarks that in all his investigations he used Sulfonal-Bayer only.

The Farbenfabriken vormals Friedr. Bayer & Co., have appointed us sole licensees and sole agents for the United States for Sulfonal-Bayer, and we offer it to the medical profession put up in half-ounce and one-ounce vials.

We prepare 5-grain and 15-grain tablets of Sulfonal-Bayer.

The tablet form is admirably adapted to the purpose of administering this drug, as when they are placed in the liquids they disintegrate and are thus received into the system. These tablets are put up in tubes containing ten and bottles containing one hundred tablets each.

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